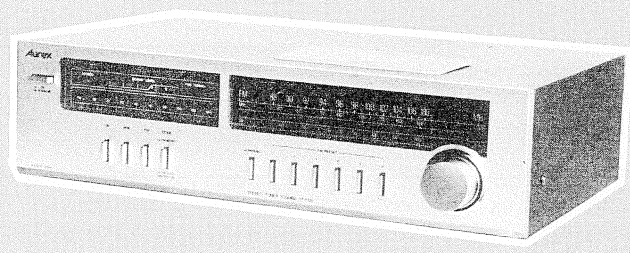
SERVICE DATA
FILE-NO. 170-109

TOSHIBA

STEREO TUNER

ST-T50



SPECIFICATIONS

FM Tuner Section

Receiving Frequency:	87.5 ∿ 108 MHz
Sensitivity (IHF):	1.9μV (10.8 dBf)
Harmonic Distortion:	MONO 0.15%
	STEREO 0.3%
S/N (IHF A Network):	MONO 75 dB
	STEREO 72 dB
Frequency Response:	30 Hz ∿ 10 kHz $\pm^{0}_{2}$ dB
Selectivity (IHF):	60 dB
Image Rejection:	60 dB
Capture Ratio:	2.0 dB
Spurious Response:	80 dB
AM Supression:	60 dB
Stereo Separation:	40 dB (1 kHz)

AM Tuner Section

	MW	LW
Receiving Frequency:	525 ∿ 1605 kHz	145 ∿ 400 kHz
Sensitivity (S/N 20 dB):	250μV/m	400μV/m
Selectivity:	25 dB	
Image Rejection:	40 dB	35 dB
S/N:	50 dB	40 dB

General

Power Supply:	220V 50 Hz for Europe 240V 50 Hz for United Kingdom and Australia
Power Consumption:	9W
Weight:	3.8 kg
Dimensions:	420(W) x 116(H) x 300(D) mm

Specifications are subject to change without notice.

TE, TU, AY

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1. OPERATING INSTRUCTIONS

Signal Level Indicator
These LEDs light up to indicate the strength of the signal being received, more LEDs lighting up for increasingly stronger signals.

FM Stereo Indicator
Lights up when an FM stereo station is being received.

Power Switch
Depress this switch to turn on power, depress once more to turn power off.

FM Frequency Indicators
These LEDs indicate the frequency of the preset FM station currently tuned in.

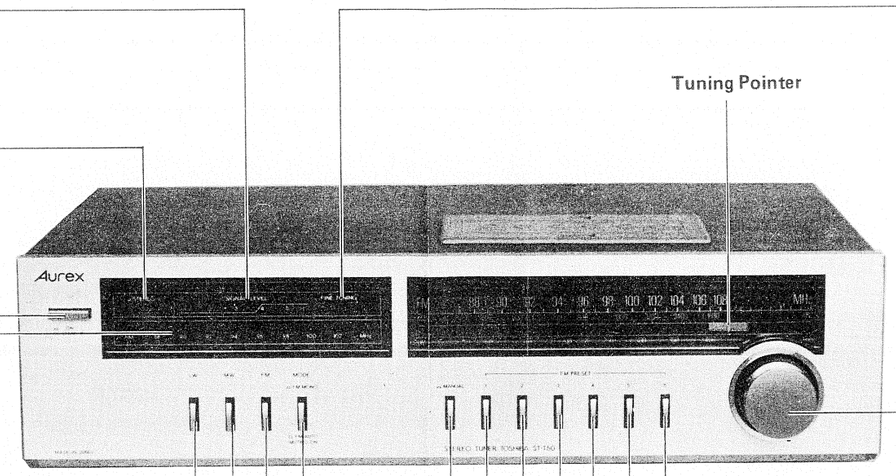


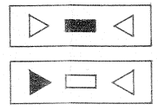
Figure 1

Function Switch
FM for FM radio broadcasts
MW for MW radio broadcasts
LW for LW radio broadcasts

Mode Switch
In the FM AUTO/MUTING ON position, the muting circuitry suppresses inter-station noise and FM stereo reception is possible. In the FM MONO position, even FM stereo broadcasts will be produced in monaural form and muting will not function. Use this position to receive weak stations that the muting circuitry may suppress.

Fine Tuning Indicator
Tune in FM broadcasts roughly by watching the SIGNAL INDICATOR, then tune in precisely by slowly rotating the tuning knob until only the green lamp of the TUNING INDICATOR comes on.

FINE TUNING



Optimum tuning (green LED is lit)

Roughly tuned (red LED is lit; slowly turn the tuning knob in the direction indicated until the green LED comes on.)

The fine tuning indicator does not operate for AM broadcasts.

Tuning Knob
Select the station of your choice by rotating this knob. When tuning an FM broadcast, the manual button must first be depressed.

FM Preset Buttons
Manual: Press this button when you wish to tune in FM stations manually (using the tuning knob).
1 – 6: Once these have been set to your favourite FM stations, the station of you choice may be instantly tuned in by pressing one of these buttons.

2. SYSTEM CONNECTIONS

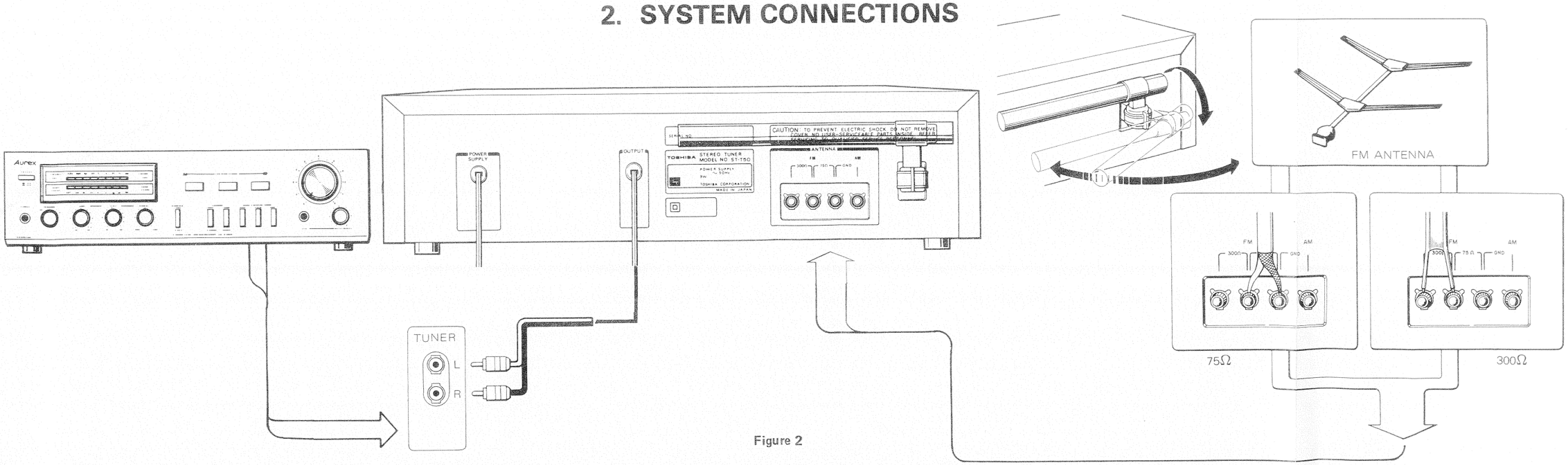


Figure 2

3. CONNECTIONS

(1) If you use a 300 ohm FM aerial, connect it to the 300 ohm terminal. Use the 75 ohm terminals if you use a 75 ohm aerial.
(2) For AM reception, pull the bar antenna away from the set and try several different positions until the AM reception is strongest.
(3) Connect the output terminals to the tuner input terminals of your amplifier making sure that the L and R cables are not reversed.
(4) All connecting cables and power cords should be kept away from the bar antenna on the rear panel in order to avoid induction noises and other possible causes of deterioration in performance.

4. TUNER OPERATION

FM Presetting Procedure

(1) Depress the FM function button
(2) Depress one of the FM preset buttons.
(3) Tune in an FM station using one of the six knobs on top of the unit (remove the cover as shown) that correspond to the FM preset button depressed. These knobs correspond, left to right, to the six FM-preset buttons on the front panel.
(4) The FM frequency indicator will show the approximate frequency of the station that is tuned.
(5) Each of the six FM-preset buttons may be tuned to any station.
(6) If you wish to tune in an FM station manually using the front panel tuning knob, depress the MANUAL button.

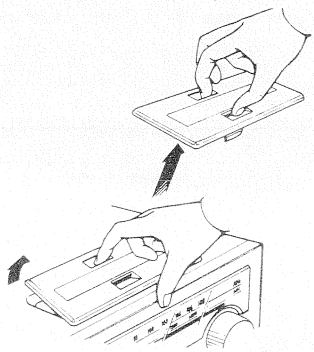


Figure 3

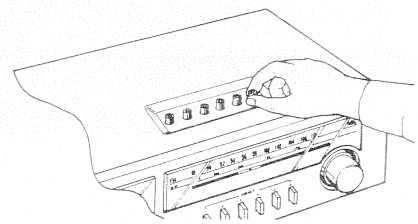


Figure 4

5. DISASSEMBLY INSTRUCTIONS

REMOVAL OF TOP COVER

1. Remove 2 screws (1) (3ϕ x 8 mm) from both sides of top cover as shown in Figure 5.
2. Remove Pre-set cover assembly (2) from top cover.
3. Remove two screws (3) (3ϕ x 6mm) holding top cover as shown in Figure 6.

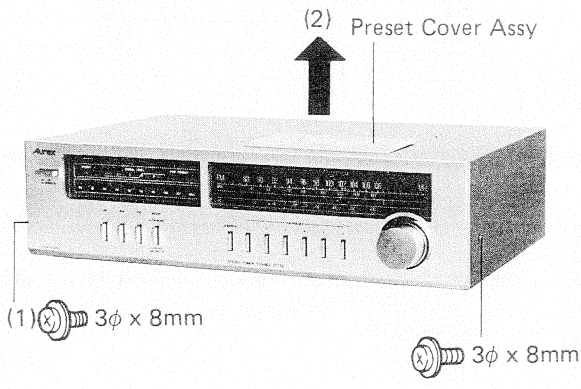


Figure 5

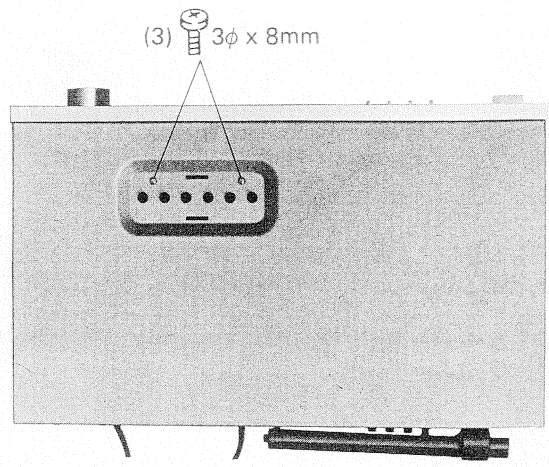


Figure 6

4. Remove three screws (4) (3ϕ x 8mm) from back side of top cover, then top cover can be removed as shown in Figure 7.

REMOVAL OF FRONT PANEL

1. Remove top cover as shown in Figures 5, 6, and 7.
2. Remove three screws (5) (3ϕ x 8mm) holding front panel and back plate as shown in Figure 8.
3. Remove three screws (6) (3ϕ x 8mm) holding front panel and bottom plate, then front panel can be removed as shown in Figure 9.

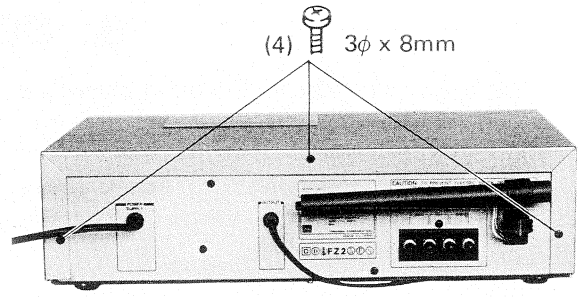


Figure 7

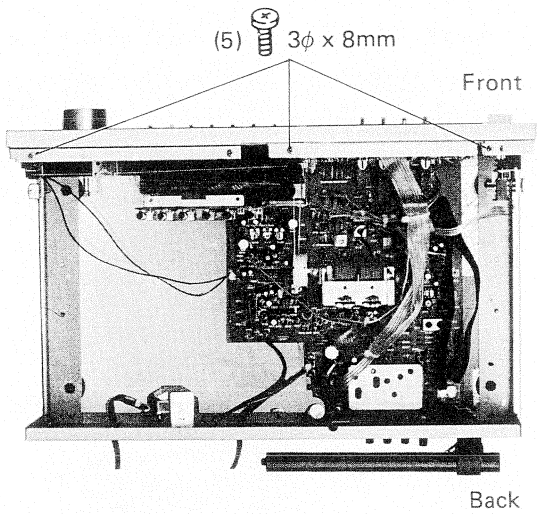


Figure 8

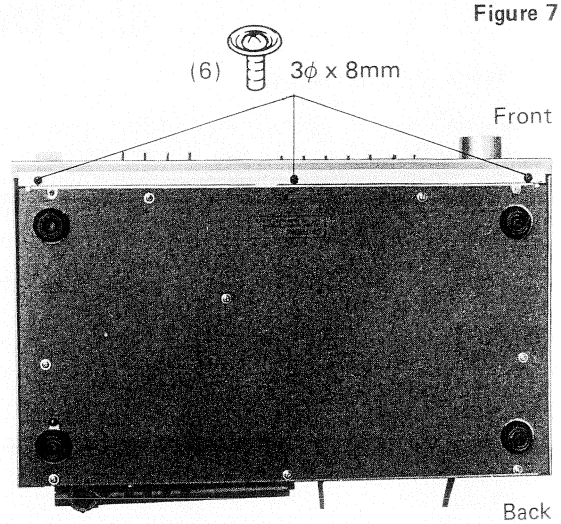
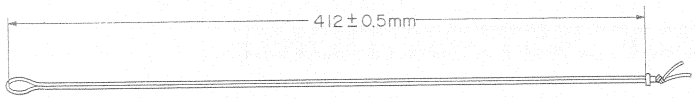
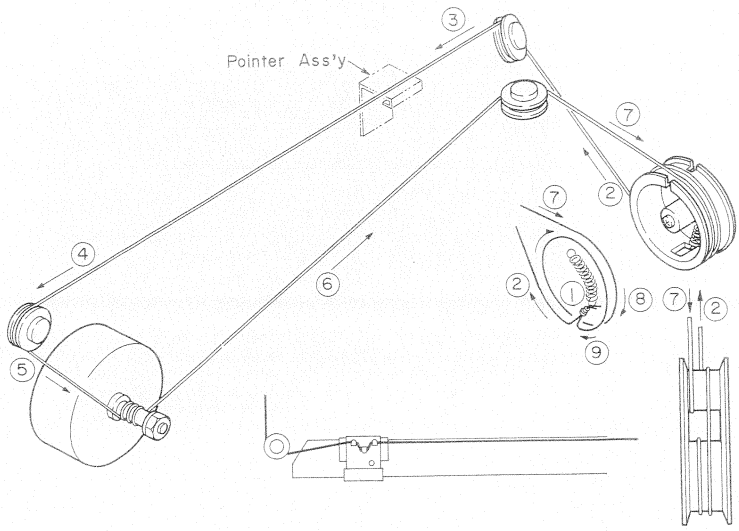


Figure 9

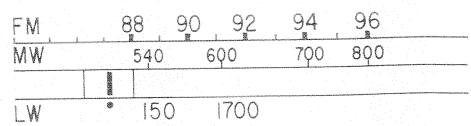
6. DIAL CORD





Dial pointer mounting position.

Mount the dial pointer to the cord in this position where the variable capacitor have been wound up fully clockwise.



1. Set the variable capacitor to the maximum capacitance (fully counterclockwise position).
2. Mount a spring to the drum and wind the dial cord in the numerical sequence as shown in the direction of arrows.

Figure 10

7. ADJUSTMENTS

LW ADJUSTMENT

1. Set Function switch to LW.
2. Set signal generator frequency as listed in TABLE 1 LW ADJUSTMENT CHART.
3. Proceed as outlined in the TABLE 1 LW ADJUSTMENT CHART.

TABLE 1 LW ADJUSTMENT CHART

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Connection (See Fig. 11.)	Adjustment	Remarks
1	Test loop	450 kHz	Tuning gang fully counter-clockwise	VTVM across output terminal	T101 T104	Adjust for Maximum
2	Test loop	150 kHz	Tuning gang fully counter-clockwise	VTVM across output terminal	T102 LW OSC.	Adjust for Maximum
3	Test loop	400 kHz	Tuning gang fully clockwise	VTVM across output terminal	C003-a OSC. Trim.	Adjust for Maximum
4	Repeat steps 2 and 3 until no further improvement is noticed.					
5	Test loop	180 kHz	Tune to signal	VTVM across output terminal	L104-a (LW) Ant. coil	Adjust for Maximum
6	Test loop	380 kHz	Tune to signal	VTVM across output terminal	C002-a LW Trim	Adjust for Maximum
7	Repeat steps 5 and 6 until no further improvement is noticed.					

MW ADJUSTMENT

1. Set Function switch to MW.
2. Set signal generator frequency as listed in TABLE 2 MW ADJUSTMENT CHART.
3. Proceed as outlined in the TABLE 2 MW ADJUSTMENT CHART.

TABLE 2 MW ADJUSTMENT CHART

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Connection (See Fig. 11.)	Adjustment	Remarks
1	Test loop	600 kHz	Tuning gang fully counter-clockwise	VTVM across Speaker terminal	T103 MW OSC.	Adjust for Maximum
2	Test loop	1600 kHz	Tuning gang fully clockwise	VTVM across Speaker terminal	C003-b MW Trim.	Adjust for Maximum
3	Repeat steps 1 and 2 until no further improvement is noticed.					
4	Test loop	600 kHz	Tune to signal	VTVM across Speaker terminal	L104-b (MW) Ant. coil	Adjust for Maximum
5	Test loop	1400 kHz	Tune to signal	VTVM across Speaker terminal	C002-b MW Trim.	Adjust for Maximum
6	Repeat steps 4 and 5 until no further improvement is noticed.					

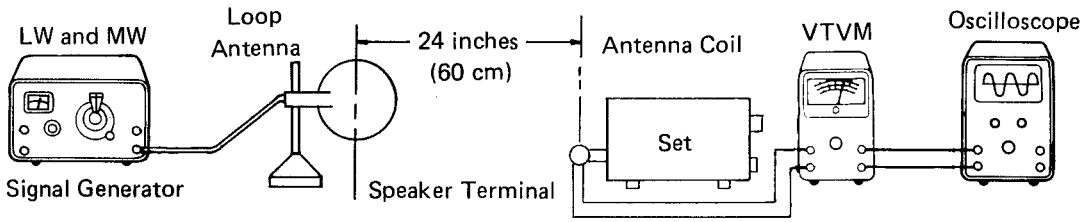


Figure 11

FM IF ADJUSTMENT

TABLE 3 FM-IF ADJUSTMENT CHART

Step	Signal Generator Connection	Signal Generator Frequency	Radio Dial Setting	Meter or Oscilloscope Connection	Adjustment	Remarks
1	Sweep Generator through buffer to Front End Pack Input	10.7 MHz	Tuning gang fully counter-clockwise	Scope to TP-1 FM as shown in Figure 12.	T105	See "S curve" in Figure 12.

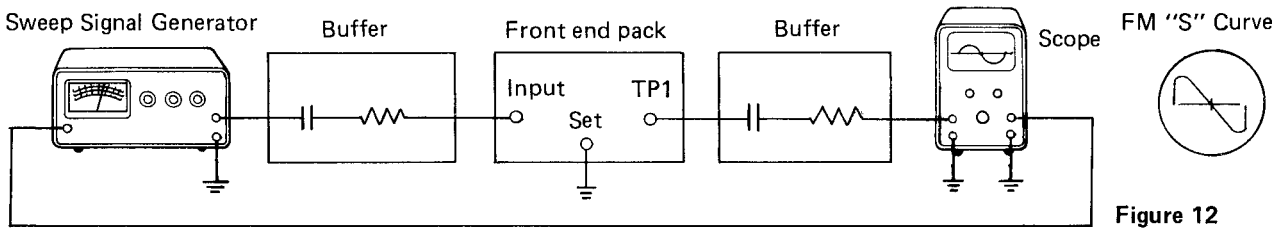


Figure 12

FM FREQUENCY COVERAGE ALIGNMENT (MANUAL & PRESET)

1. Push the manual button.
2. Set the frequency pointer to 108.7 MHz (F max.).
3. Turning R176, tune in 108.7 MHz (F max. adjustment).
4. Set the frequency pointer to 87.5 MHz (F min.).
5. Turning R120, tune in 87.5 MHz
6. Proceed adjustments repeating 2, 3, 4, 5 steps.

* Check F min. and F max. on PRESET CH 1 to CH 6 respectively.

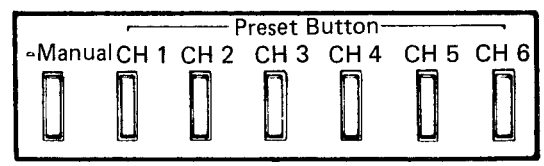


Figure 13

FREQUENCY LEVEL METER ADJUSTMENT

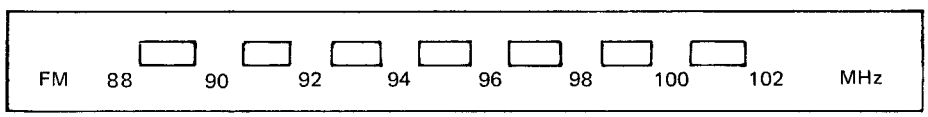


Figure 14

Set the Signal Generator to 102 MHz and adjust R174 (10K ohm) so that the 7th LED (D412) light up when adjusting the receiving frequency of the set to 102 MHz.

19 kHz ALIGNMENT

1. Connect the frequency counter to(Q201) 9 pin.
2. Adjust R203 to obtain 19 kHz ±100Hz.

STEREO SEPARATION ADJUSTMENT

1. When the signal of L channel is set to input (antenna), adjust R209 so that the reading on the signal of R channel on output terminal is min.
2. When the signal of R channel is set to input (antenna), adjust R209 so that the reading on the signal of L channel on output terminal is min.

DISTORTION ADJUSTMENT (MONO)

1. When the reference distortion ratio 0.6% is not obtained, turn the green core of T105.

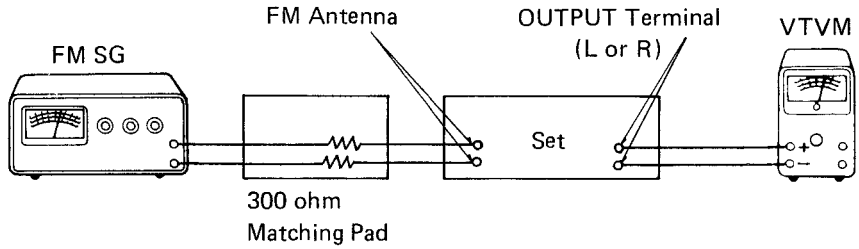


Figure 15

FM SIGNAL LEVEL METER ADJUSTMENT

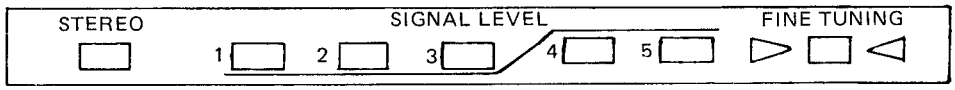


Figure 16

Adjust R137 (100 k ohm) so that the 1th LED(D401) light up when input is +20 dB.

Adjust R137 (100K ohm) so that the 5th LED (D405) light up when input is +60 dB.

CAUTION: When realigning the FM Receiving Frequency, the lower side of the frequency range must not be below 87.5 MHz in order to comply with FTZ regulations in West Germany.

ADJUSTING PARTS LOCATION

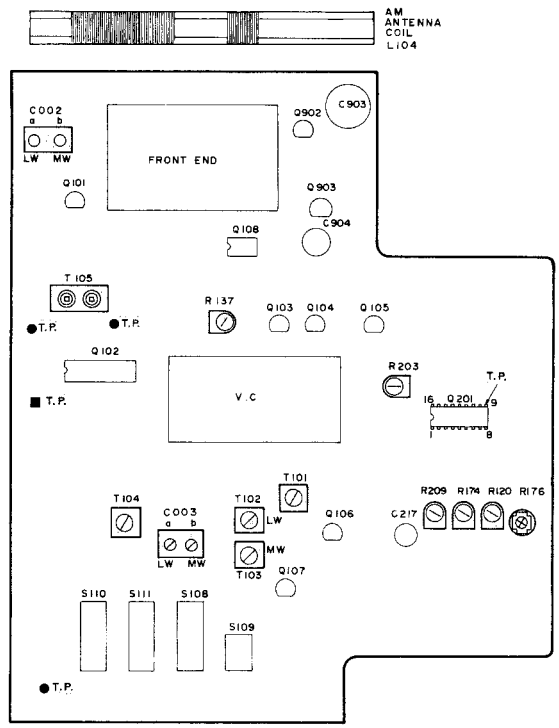


Figure 17

TEST EQUIPMENTS/TOOLS REQUIRED

1. Sweep signal generator (Sweep range of at least 300 kHz, centre frequency of 10.7 MHz.)
2. Signal generator with a frequency range of at least from 140 kHz to 19 MHz for AM, from 87 MHz to 110 MHz and 10.7 MHz for FM.
3. Oscilloscope with a wide range amplifier of approximately 100 kHz.
4. Test loop – a coil of any size wire with one turn or more.
5. VTVM (Vacuum tube voltmeter)

NOTES:
1. During alignment keep the signal generator output at the lowest level where useable signal output from the set can be maintained.
2. Ground connection of signal generator ..... To chassis ground.
3. Generator modulation ..... 400 Hz, 30%.
4. For alignment points, see schematic diagram.

8. BLOCK DIAGRAM

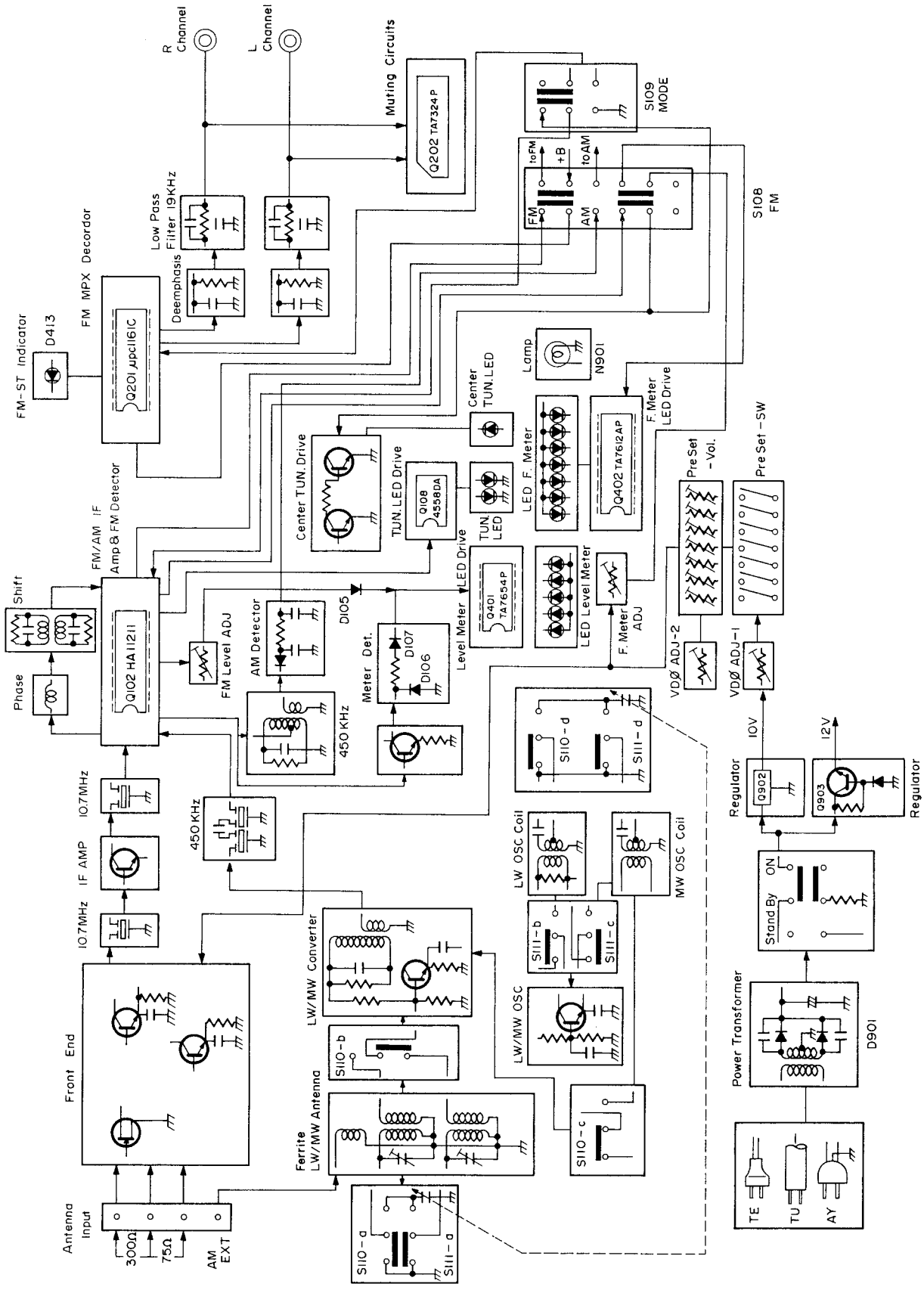
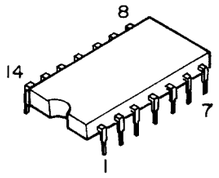


Figure 18

9. IC BLOCK DIAGRAM



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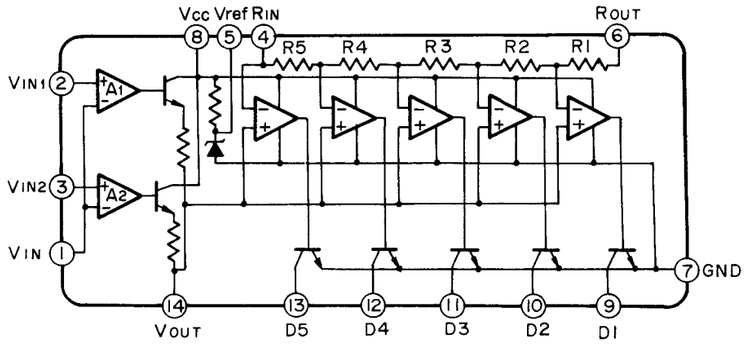

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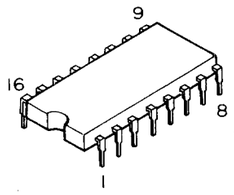

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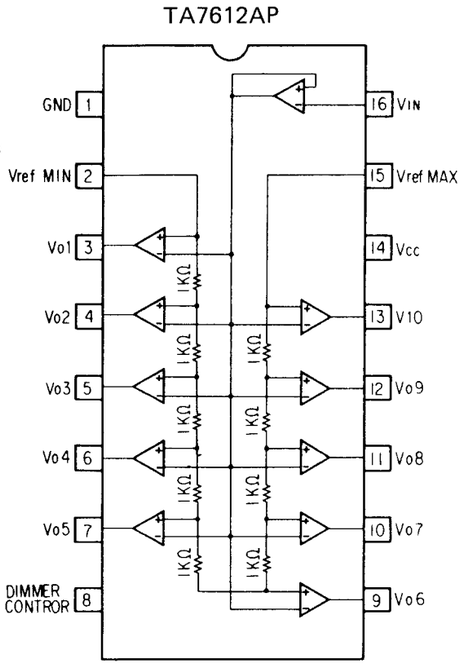
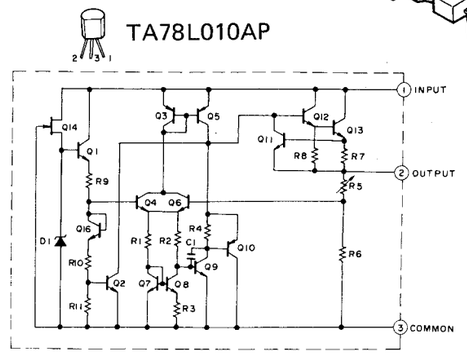


TA78L010AP



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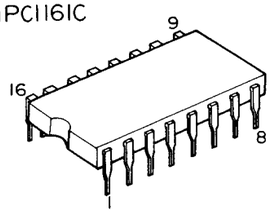

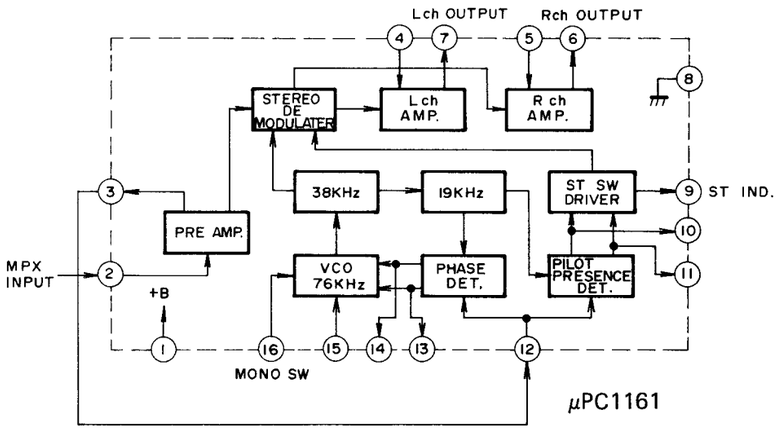

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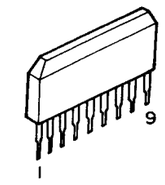

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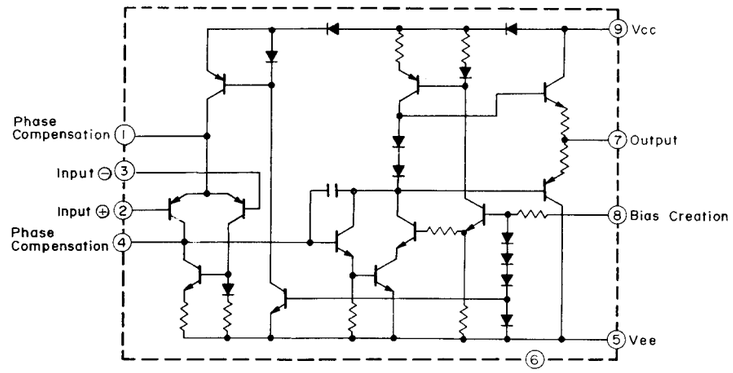

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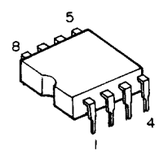
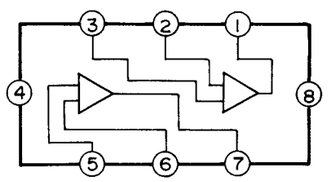


NJM4558D-A



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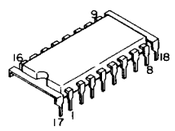


HA12111

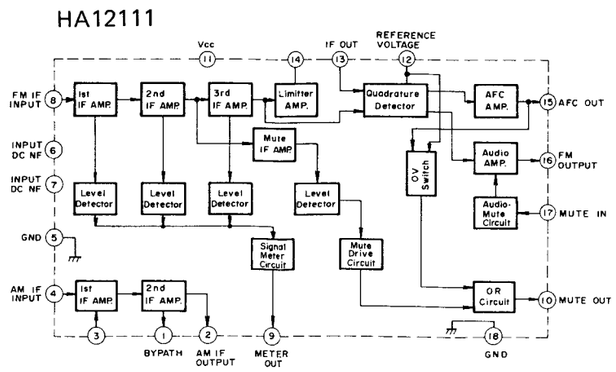


Figure 19

10. P.C. BOARD PARTS LOCATIONS

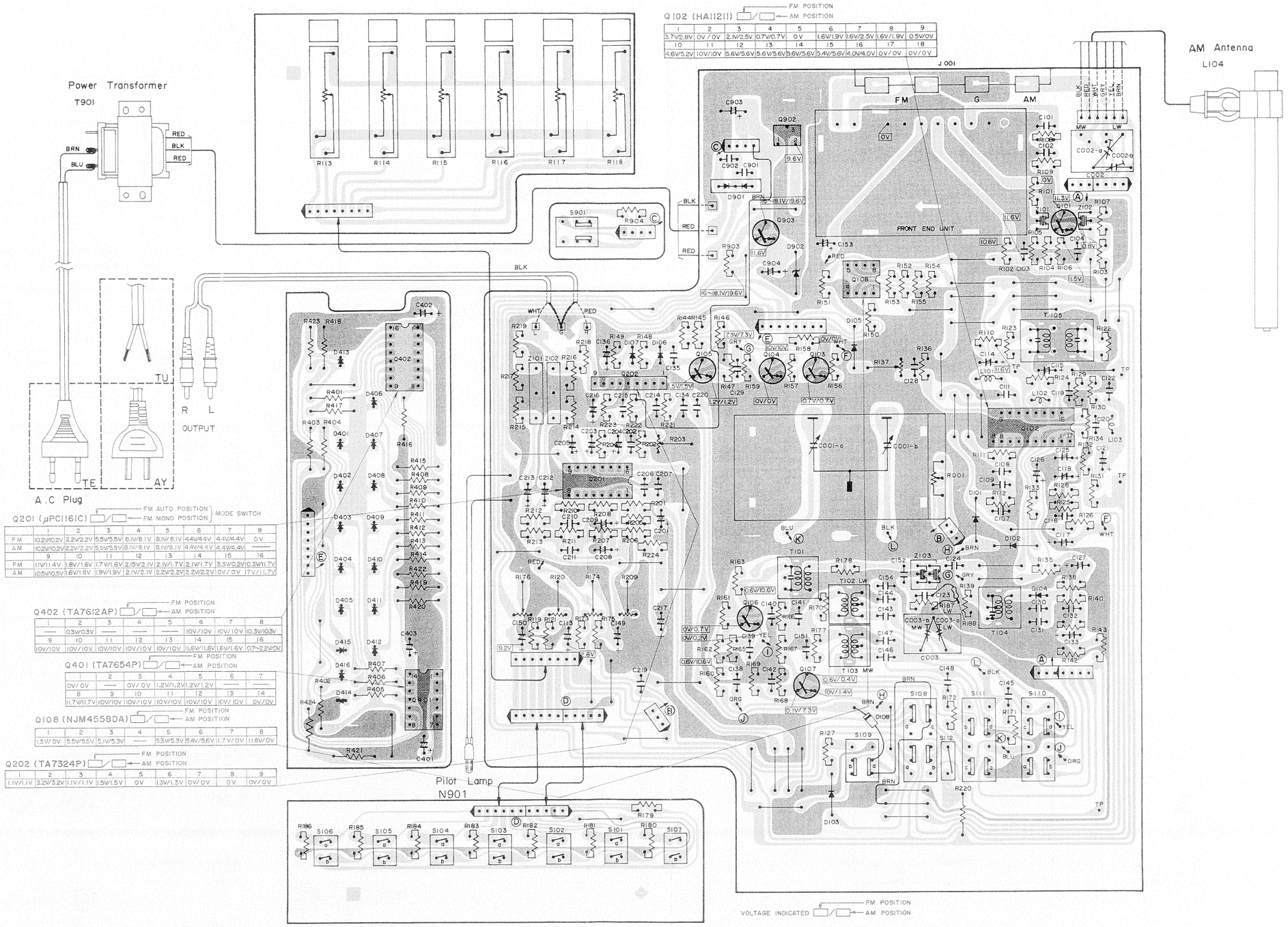
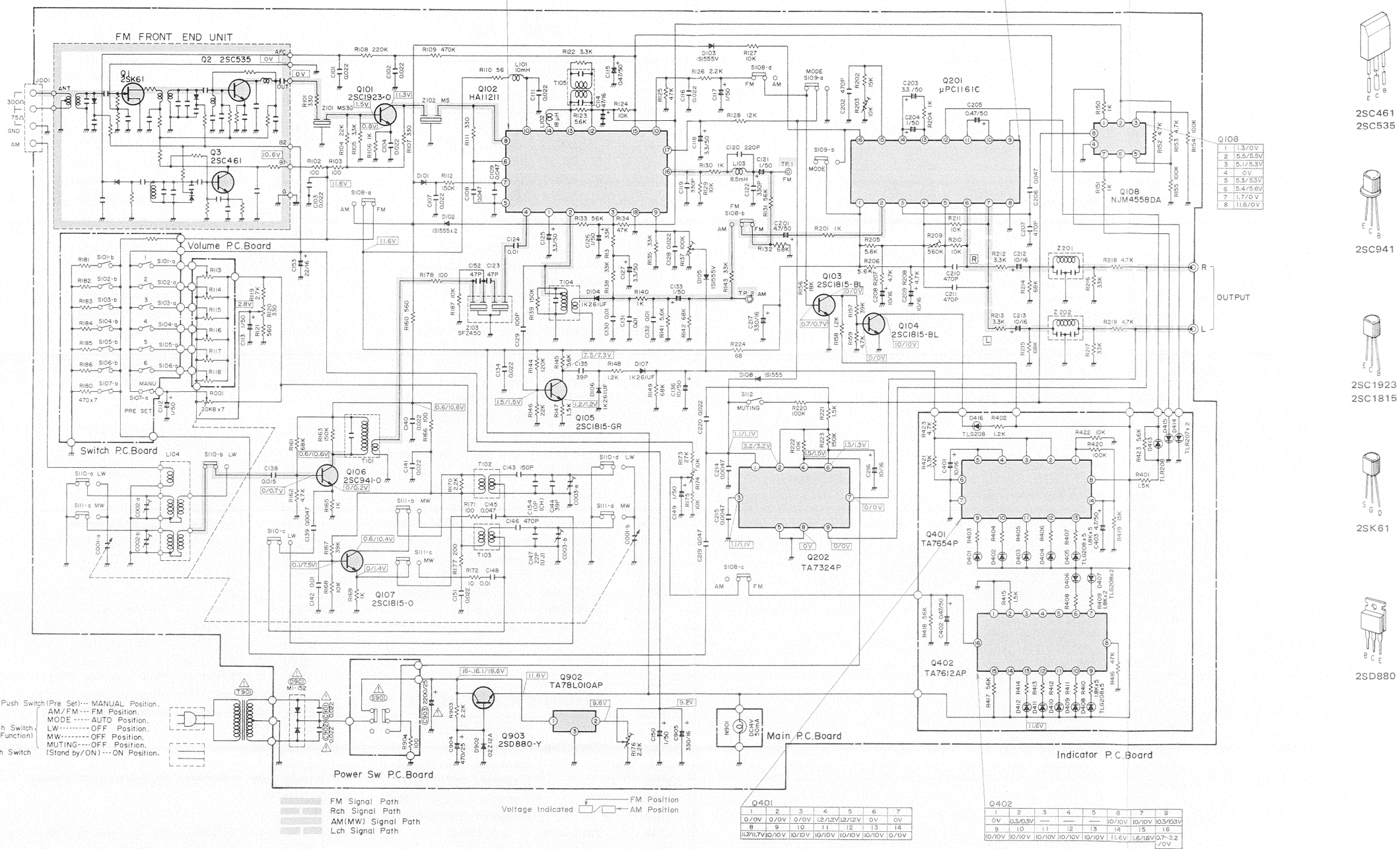


Figure 20

11. SCHEMATIC DIAGRAM



Q102

1	2	3	4	5	6	7	8	9
3.7/2.8V	0/0V	2.1/2.5V	0.7/0.7V	0V	1.6/1.9V	1.6/2.5V	1.6/1.9V	0.5/0V
10	11	12	13	14	15	16	17	18
4.6/5.2V	0/10V	5.6/5.6V	5.6/5.6V	5.6/5.6V	5.6/5.6V	5.4/5.6V	4.0/4.0V	0/0V	0/0V

Q201

	1	2	3	4	5	6	7	8
FM	10.2/10.2V	2.2/2.2V	5.5/5.5V	8.1/8.1V	8.1/8.1V	4.4/4.4V	4.4/4.4V	0 V
AM	10.2/10.2V	2.2/2.2V	5.5/5.5V	8.1/8.1V	8.1/8.1V	4.4/4.4V	4.4/4.4V	
	9	10	11	12	13	14	15	16
FM	11/11.4V	1.8/1.6V	1.7/1.6V	2.5/2.1V	2.1/1.7V	2.1/1.7V	3.3/0.2V	0.3/11.7V
AM	10.5/10.5V	1.6/1.6V	1.9/1.9V	2.1/2.1V	2.2/2.2V	2.2/2.2V	0/0V	7/11.7V

Q108

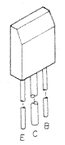
1	1.3/0V
2	5.5/5.5V
3	5.1/5.3V
4	0V
5	5.3/5.3V
6	5.4/5.6V
7	1.7/0 V
8	11.6/0V

Q401

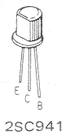
1	2	3	4	5	6	7	8
0/0V	0/0V	0/0V	1.2/1.2V	1.2/1.2V	0V	0V	
9	10	11	12	13	14	15	16
11.2/11.7V	10/10V	10/10V	10/10V	10/10V	10/10V	10/10V	0/0V

Q402

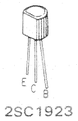
1	2	3	4	5	6	7	8
0V	0.3/0.3V	—	—	—	10/10V	10/10V	10.3/10.3V
9	10	11	12	13	14	15	16
10/10V	10/10V	10/10V	10/10V	10/10V	11.6V	1.6/1.6V	0.7~2.2/0V



2SC461
2SC535

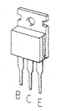


2SC941



2SC1923
2SC1815

2SK61

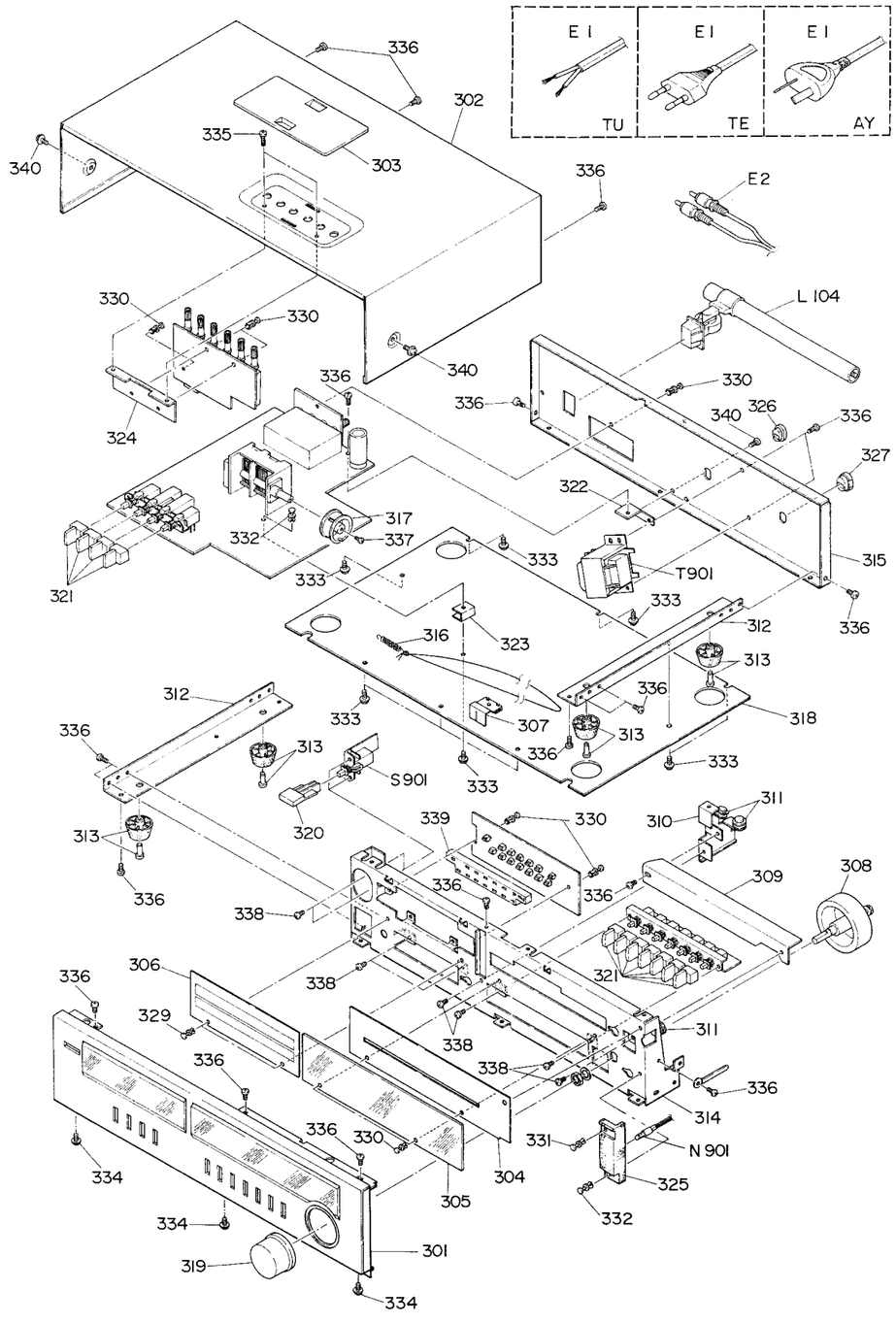


2SD880

Figure 21

CAUTION:
The ⚠ mark, the symbol No. circlued with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

12. CABINET PARTS LOCATIONS



NOTE: Parts excluded in the Parts List are not available as replacement parts.

Figure 22

13. PARTS LIST

CAUTION: The ⚠ Mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

	Symbol No.	Part No.	Description
	CABINET PARTS		
	301	20017151	Front Panel Ass'y
	302	20015195	Cover, Top
	303	20031088	Cover Ass'y, Preset
	304	20033120	Back Plate, Dial
	305	20033121	Plate, Dial
	306	20033122	Plate, Decoration
	307	22741335	Pointer
	308	22749270	Tuning Shaft Ass'y
	309	20022366	Rail, Pointer
	311	22742217	Pulley Ass'y
	313	22828066	Leg
	315	20015193	Jack Plate (TE)
	315	20015197	Jack Plate (TU, AY)
	316	20866009	Spring, Drum
	317	22742229	Drum
	318	20822095	Plate, Bottom
	319	22884029	Knob Ass'y, Tuning
	320	25837457	Knob, Power
	321	22884013	Knob Ass'y, Push
	325	25841228	Holder, Lamp
⚠	326	25845120	Bush, Nylon
⚠	327	25845528	Bush, Nylon (AC Cord)
	329	22705021	Rivet, Plastic, 3ϕ x 3.5mm
	330	22705022	Rivet, Plastic, 3ϕ x 5.5mm
	331	22705030	Rivet, Plastic, 3ϕ x 8mm
	332	22705034	Rivet, Plastic, 3.5ϕ x 5.5mm
	333	22701436	Screw, T PAN, 3ϕ x 8mm
	334	22707590	Screw, T PAN, 3ϕ x 8mm
	335	22701457	Screw, BID, 3ϕ x 6mm
	336	22701326	Screw, BID, 3ϕ x 8mm
	337	22707473	Screw, BID, 2.6ϕ x 6mm
	338	22707066	Screw, BID, 3ϕ x 6mm
	339	20031084	Grille, LED
	340	22707522	Screw, FL DT, 3ϕ x 6mm
	TRANSISTORS, IC'S & DIODES		
	Q101		Transistor, 2SC1923-O
	Q102	22114626	IC, HA11211
	Q103, 104		Transistor, 2SC1815-BL
	Q105		Transistor, 2SC1815-GR
	Q106		Transistor, 2SC941-TM.O
	Q107		Transistor, 2SC1815-O
	Q108	22114470	IC, NJM4558D-A
	Q201	22114627	IC, μPC1161

	Symbol No.	Part No.	Description
	Q202		IC, TA7324P
	Q401		IC, TA7654P
	Q402		IC, TA7612AP
	Q902		IC, TA78L010AP
	Q903		Transistor, 2SD880-Y
	D101, 102		Diode, 1S1555V
	D103, 105		Diode, 1S1555V
	D104, 106	22115498	Diode, 1K261UF
	D107	22115498	Diode, 1K261UF
	D108		Diode, 1S1555V
	D401, 402		Diode, TLG208
	D403, 404		Diode, TLG208
	D405, 406		Diode, TLG208
	D407, 408		Diode, TLG208
	D409, 410		Diode, TLG208
	D411, 412		Diode, TLG208
	D413		Diode, TLR208
	D414, 415		Diode, TLR207
	D416		Diode, TLG208
⚠	D901	22115427	Diode, MI-152
	D902		Diode, 02Z12A
	ELECTRICAL PARTS		
	L101	22291082	Coil, 10μH
	L102	22241050	Coil, 18μH
	L103	22232219	Coil, 8.5mH
	L104	22242808	Coil, AM Antenna
	T101	22264626	Transformer, IF (AM)
	T102	22205046	Coil, OSC (LW)
	T103	22245206	Coil, OSC (MW)
	T104	22266326	Transformer, IF (AM Detect)
	T105	22267349	Transformer, IF (FM Detect)
⚠	T901	22223811	Transformer, Power
	Z001	22131367	Front End, FM
	Z101, 102	22153140	Filter, Ceramic (FM)
	Z103	22153106	Filter, Ceramic (AM)
	Z201, 202	22134115	Filter, Low-pass
	S101, 102	22195632	Switch, Push (Pre Set)
	S103, 104		
	S105, 106		
	S107		
	S108, 109	22195609	Switch, Push (Function)
	S110, 111		
	S112		
⚠	S901	22195444	Switch, Push (Power)
	J001	22162437	Terminal, Antenna, 4P

Symbol No.	Part No.	Description
N901	22113500	Lamp, Pilot, 14V/50mA (GRN)
⚠ E1	22176286	Cord, Power (TE)
⚠ E1	22176536	Cord, Power (TU)
⚠ E1	22176588	Cord, Power (AY)
E2	22170352	Cord, US PIN
CAPACITORS D = ±0.5pF , J = ±5%, K = ±10%, Z = −20 +80% ABBREVIATIONS: CD = Ceramic Disk, EL = Electrolytic, MY = Mylar, PP = Polypropylene		
C001	22307109	Variable, VC-2-426
C002, 003	22309149	Trimmer
C101, 102	22342223	CD, 0.022mfd, 50V, Z
C103, 104	22342223	CD, 0.022mfd, 50V, Z
C107	22342223	CD, 0.022mfd, 50V, Z
C108, 109	22342473	CD, 0.047mfd, 50V, Z
C111	22342223	CD, 0.022mfd, 50V, Z
C112, 113	22488109	EL, 1mfd, 50V
C114	22485470	EL, 47mfd, 16V
C115	22488478	EL, 0.047mfd, 50V
C116	22342223	CD, 0.022mfd, 50V, Z
C117	22488109	EL, 1mfd, 50V
C118	22488339	EL, 3.3mfd, 50V
C119	22349331	CD, 330pF, 50V, K
C120	22349221	CD, 220pF, 50V, K
C121	22488109	EL, 1mfd, 50V
C122	22349331	CD, 330pF, 50V, K
C123	22362470	CD, 47pF, 50V, K
C124	22342103	CD, 0.01mfd, 50V, Z
C125	22488339	EL, 3.3mfd, 50V
C126	22488109	EL, 1mfd, 50V
C127	22488339	EL, 3.3mfd, 50V
C128	22342223	CD, 0.022mfd, 50V, Z
C129	22349101	CD, 100pF, 50V, K
C130	22342103	CD, 0.01mfd, 50V, Z
C131	22342103	CD, 0.01mfd, 50V, Z
C132	22342103	CD, 0.01mfd, 50V, Z
C133	22488109	EL, 1mfd, 50V
C134	22342223	CD, 0.022mfd, 50V, Z
C135	22362390	CD, 39pF, 50V, K
C136	22488100	EL, 10mfd, 50V
C138	22371153	MY, 0.015mfd, 50V, J
C139	22371472	MY, 0.0047mfd, 50V, J
C140	22342223	CD, 0.022mfd, 50V, Z
C141	22342223	CD, 0.022mfd, 50V, Z
C142	22372103	MY, 0.01mfd, 50V, K
C143	22321083	PP, 150pF, 50V, J
C144	22360137	CD, 39pF, 50V, J
C145	22372473	MY, 0.047mfd, 50V, K
C146	22321053	PP, 470pF, 50V, J
C147	22360179	CD, 22pF, 50V, K, (UJ)
C148	22372103	MY, 0.01mfd, 50V, K
C149	22488109	EL, 1mfd, 50V

Symbol No.	Part No.	Description
C150	22488109	EL, 1mfd, 50V
C151	22342223	CD, 0.022mfd, 50V, Z
C152	22362470	CD, 47pF, 50V, K
C153	22485220	EL, 22mfd, 16V
C154	22360310	CD, 10pF, 50V, D
C201	22488479	EL, 4.7mfd, 50V
C202	22321053	PP, 470pF, 50V, J
C203	22488339	EL, 3.3mfd, 50V
C204	22488109	EL, 1mfd, 50V
C205	22488478	EL, 0.47mfd, 50V
C206	22342473	CD, 0.047mfd, 50V, Z
C207	22349471	CD, 470pF, 50V, K
C208, 209	22488100	EL, 10mfd, 16V
C210, 211	22321053	PP, 470mfd, 50V, J
C212, 213	22488100	EL, 10mfd, 16V
C214, 215	22349472	CD, 0.0047mfd, 50V, K
C216	22488100	EL, 10mfd, 16V
C217	22485331	EL, 330mfd, 16V
C219	22342473	CD, 0.047mfd, 50V, Z
C220	22342223	CD, 0.022mfd, 50V, Z
C401	22488100	EL, 10mfd, 16V
C402	22488478	EL, 0.47mfd, 50V
C403	22488479	EL, 4.7mfd, 50V
⚠ C901, 902	22342223	CD, 0.022mfd, 50V, Z
⚠ C903	22486222	EL, 2200mfd, 25V
C904	22486471	EL, 470mfd, 25V
C905	22485331	EL, 330mfd, 16V
RESISTORS All resistors are carbon film ¼W, ±5%, unless otherwise noted.		
R101	22555331	330 ohm
R102	22555101	100 ohm
R103	22555101	100 ohm
R104	22555223	22k ohm
R105	22555332	3.3k ohm
R106	22555102	1k ohm
R107	22555331	330 ohm
R108	22555224	220k ohm
R109	22555474	470k ohm
R110	22555560	56 ohm
R111	22555331	330 ohm
R112	22555154	150k ohm
R113, 114	22650460	20k ohm, B, Variable
R115, 116	22650460	20k ohm, B, Variable
R117, 118	22650460	20k ohm, B, Variable
R119	22555272	2.7k ohm
R120	22658500	330 ohm, Semi-fixed
R121	22555561	560 ohm
R122	22555332	3.3k ohm
R123	22555562	5.6k ohm
R124	22555103	10k ohm

Symbol No.	Part No.	Description
R125	22555473	47k ohm
R126	22555222	2.2k ohm
R127	22555103	10k ohm
R128	22555123	12k ohm
R129	22555103	10k ohm
R130	22555102	1k ohm
R131	22555563	56k ohm
R132	22555683	68k ohm
R133	22555563	56k ohm
R134	22555473	47k ohm
R135	22555333	33k ohm
R136	22555333	33k ohm
R137	22658495	100k ohm, Semi-fixed
R138	22555333	33k ohm
R139	22555154	150k ohm
R140	22555102	1k ohm
R141	22555562	5.6k ohm
R142	22555683	68k ohm
R143	22555473	47k ohm
R144	22555124	120k ohm
R145	22555562	5.6k ohm
R146	22555223	22k ohm
R147	22555152	1.5k ohm
R148	22555122	1.2k ohm
R149	22555683	68k ohm
R150, 151	22555102	1k ohm
R152, 153	22555472	4.7k ohm
R154, 155	22555104	100k ohm
R156	22555183	18k ohm
R157	22555393	39k ohm
R158	22555122	1.2k ohm
R159	22555472	4.7k ohm
R160	22555561	560 ohm
R161	22555683	68k ohm
R162	22555472	4.7k ohm
R163	22555154	150k ohm
R165	22555102	1k ohm
R166	22555101	100 ohm
R167	22555393	39k ohm
R168	22555103	10k ohm
R169	22555102	1k ohm
R170	22555222	2.2k ohm
R171	22555101	100 ohm
R172	22555100	10 ohm
R173	22555273	27k ohm
R174	22658498	10k ohm, Semi-fixed
R175	22555103	10k ohm
R176	22658453	2.2k ohm, Semi-fixed
R177	22555221	220 ohm
R178	22555101	100 ohm
R179	22555331	330 ohm
R180, 181	22555471	470 ohm
R182, 183	22555471	470 ohm
R184, 185	22555471	470 ohm

Symbol No.	Part No.	Description
R186	22555471	470 ohm
R187	22555103	10k ohm
R201	22555102	1k ohm
R202	22555153	15k ohm
R203	22658498	10k ohm, Semi-fixed
R204	22555102	1k ohm
R205, 206	22555562	5.6k ohm
R207, 208	22555472	4.7k ohm
R209	22658548	560k ohm, Semi-fixed
R210, 211	22555103	10k ohm
R212, 213	22555332	3.3k ohm
R214, 215	22555683	68k ohm
R216, 217	22555333	33k ohm
R218, 219	22555472	4.7k ohm
R220	22545104	100k ohm
R221	22555152	1.5k ohm
R222	22555103	10k ohm
R223	22555154	150k ohm
R224	22555680	68 ohm
R401	22545152	1.5k ohm
R402	22545122	1.2k ohm
R403, 404	22545182	1.8k ohm
R405, 406	22545182	1.8k ohm
R407, 408	22545182	1.8k ohm
R409, 410	22545182	1.8k ohm
R411, 412	22545182	1.8k ohm
R413, 414	22545182	1.8k ohm
R415	22545152	1.5k ohm
R416	22545473	47k ohm
R417	22545563	56k ohm
R418	22545563	56k ohm
R419	22545153	15k ohm
R420	22545104	100k ohm
R421	22545332	3.3k ohm
R422	22545103	10k ohm
R423	22545562	5.6k ohm
R424	22545472	4.7k ohm
R903	22555222	2.2k ohm
R904	22555101	100 ohm

ACCESSORIES

	22124461	Feeder Ass'y
	22902704	Owner's Manual